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UNITED STATES DEPARTMENT OF AGRICULTURE  
Agricultural Marketing Service  
Marketing Research Division

October 1954

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VARIATIONS IN COTTON BALE WEIGHTS WITH APPLICATION TO  
LIGHTWEIGHT AND OVERWEIGHT BALES 1/  
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For 25 years or more, the average weight of the American upland bale has held remarkably steady, ranging from a low of about 502 pounds in 1951 to a high of 519 pounds in 1937. The average weight of bales for individual States, while showing generally more variability than for the United States, has also held within close ranges. Not revealed in these highly satisfactory averages, however, is the existence of lightweight and extra-heavy bales, both of which create problems, such as inefficiencies in marketing.

Light bales have several distinct disadvantages in marketing. Such bales represent an uneconomical use of baling material and are extremely difficult to compress to required densities. Bales considerably below average in weight are subject to appreciably higher per pound marketing costs, since charges for services, such as storage, sampling, weighing, and compression, usually are assessed on a per bale basis irrespective of weight. Also, the usual tare allowance (4.4 percent of the gin bale weight) provided in mill rules is calculated on the assumption of 22 pounds of bagging and ties on a 500-pound bale. Lightweight bales carrying such a tare exceed the allowance and are therefore subject to penalty for over tare. In order to offset this factors, penalties are assessed in marketing channels.

Extra-heavy bales (650 pounds or more) are a serious potential source of damage to both gin press and compress equipment. Such bales also slow down operations and endanger workmen at both locations. Extra-heavy bales are more difficult to handle, store, and transport, and are more ragged in appearance. Also, failure of ties is not uncommon. In recent years, efforts have been made to discourage the packaging of cotton in overweight bales, and penalties have been levied in some areas.

Questions frequently arise concerning losses to farmers resulting from penalties assessed in the cotton trade against lightweight and overweight bales of cotton. The penalties themselves can be readily ascertained by reference to the trading rules established by the several State or regional cotton trade associations. The extent of the loss to farmers, however, cannot be determined without information both as to the proportions of cotton falling within specified bale-weight intervals and the strictness with which penalties are enforced in transactions involving farmers.

This report has two purposes. One is to give some information on the proportionate distribution of bale weights by weight groups by States and regions. The other is to show the extent to which producers in the several cotton trade regions are subject to penalty on account of lightweight or overweight bales.

1/ Prepared in the Fibers Section, Market Organization and Costs Branch. Collection of the original data was made possible by the cooperation of field representatives of the Cotton Division, Agricultural Marketing Service, and ginner.



No information about the extent to which penalty provisions are applied in trading is available, although apparently such penalties are strictly enforced in some regions.

About 12 percent of the gins in the Cotton Belt cooperated in providing the bale weight information presented in this report, together with several other series of data. Such gins were selected to provide representative cross-sections of all important producing States. These gin bale weights were first tabulated at 50-pound intervals and then according to weight intervals to match those for the penalties applicable for each of the State or regional cotton trade associations.

About 71 percent of the cotton produced in the 1953-54 season was packaged in bales weighing between 451 and 550 pounds, the range of weights considered to be most suitable for efficient handling and marketing (table 1). Approximately 86 percent of the ginnings was within the range of 451 to 650 pounds, which was penalty free except for the small quantity produced in Oklahoma weighing from 451 to 475 pounds. Of the remaining 14 percent, 13 percent of the bales weighed 450 pounds or less, but all of this was not subject to penalty. Only a negligible proportion weighed 300 pounds or less. Similar data were computed for the 1951 and 1952 crops <sup>2</sup>/<sub>0</sub>. Some differences were noted in the results for individual States for the 3 years for which data are now available. However, no significant differences in the distribution of bale weights were observable in the national averages for the 3 crop years involved.

Cotton mills are interested in bale weights primarily from the standpoint of tare. Mill rules on the subject of tare or bale weights are generally less exacting than those of shippers in that mill rules apply to entire lots rather than to individual bales. Southern Mill Rules provide an allowance of 4.4 percent for the weight of bagging and ties for uncompressed lots of cotton and 4.8 percent for compressed cotton. Tare in excess of the allowance becomes a basis for claim. The application of these provisions by mills in the purchase of their cotton requires other agencies in marketing channels to protect themselves against losses from excess tare. With an actual tare of 20 pounds, uncompressed bales weighing less than 450 pounds are a source of excess tare and a potential source of claims.

State or regional cotton trade shippers associations have adopted rules pertaining to bale weights for the protection of their dealer members. It is not practicable to weigh the tare on individual bales and determine the percentage of its weight to the total weight of the bale. Therefore, an attempt at approximating the tare-lint relationship is made simply by reference to the gross weight of the bale. Some of the trade associations apply a sliding scale of penalties to graduated bale weights. In other trade regions, however, less precise methods are followed, with reliance upon normal weight distribution producing satisfactory average weights.

A detailed analysis of the volume of cotton subject to weight penalties required an examination of the penalty rules applicable to each of the six regional shippers' trade associations. As the penalties and weight groups to which the penalties apply vary from region to region, it was necessary to consider each region separately. The penalties cited were those given in the latest announcement at hand from the respective trade associations and in each case were the published rules in effect for the 1953-54 season.

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<sup>2</sup>/<sub>0</sub> Variations in Cotton Bale Weights, and Associated Marketing Problems, United States Department of Agriculture, Production and Marketing Administration, October 1953.



Table 1.--Percentage distribution of gin bale weights of upland cotton according to specified weight intervals,  
by States, season 1953-54 <sup>1/</sup>

State	Weight of bales (Pounds)											
	300	301	351	401	451	501	551	601	651	700	Total	
	or	to	to	to	to	to	to	to	to	or		
	less	350	400	450	500	550	600	650	700	more		
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	
Alabama.....	0.3	1.2	3.7	9.3	28.0	41.3	13.0	2.6	0.5	0.1	100.0	
Arizona.....	.1	2/	.3	7.6	42.8	38.5	8.7	1.8	.2	2/	100.0	
Arkansas.....	2/	.4	2.1	9.0	31.4	41.0	13.1	2.6	.3	.1	100.0	
California.....	.1	.1	.6	11.3	44.9	33.3	7.8	1.7	.2	2/	100.0	
Florida.....	.5	7.1	13.9	13.4	22.3	22.9	11.5	5.0	3.1	.3	100.0	
Georgia.....	.4	2.0	4.9	13.4	29.7	33.3	12.8	2.8	.6	.1	100.0	
Louisiana.....	.3	.8	3.1	10.8	28.0	38.1	14.7	3.2	.8	.2	100.0	
Mississippi.....	.1	.5	2.6	10.0	33.2	40.1	10.9	2.0	.5	.1	100.0	
Missouri.....	.1	.7	3.7	13.2	31.0	35.4	12.1	2.9	.7	.2	100.0	
New Mexico.....	2/	.4	1.7	12.7	40.5	34.2	8.4	1.8	.3	2/	100.0	
North Carolina.....	.5	3.5	7.5	16.3	30.1	29.4	10.1	2.0	.5	.1	100.0	
Oklahoma.....	2/	1.1	3.2	11.2	28.4	36.4	15.0	3.8	.8	.1	100.0	
South Carolina.....	.4	2.5	7.2	16.1	29.4	28.7	12.3	2.8	.4	.2	100.0	
Tennessee.....	.1	.4	2.6	8.8	27.8	43.3	14.3	2.3	.4	-	100.0	
Texas.....	.2	.4	1.4	7.9	29.2	41.2	16.1	2.9	.6	.1	100.0	
Virginia.....	-	.9	3.8	8.2	25.3	34.5	24.5	2.4	.4	-	100.0	
United States 3/	.2	.7	2.4	10.1	32.6	38.2	12.7	2.5	.5	.1	100.0	

<sup>1/</sup> Data based on information obtained from ginnerers.

<sup>2/</sup> Less than 0.05 percent.

<sup>3/</sup> Includes data from minor cotton-producing States.

Southeastern States    3/

The only penalty in this region based specifically on the weight of the bale pertains to bales weighing 300 pounds or less. Only a negligible proportion of the 1953 crop, 0.4 percent, was in this lightweight group (table 2). Such bales may be rejected, but if accepted must be penalized 20 pounds. Bales weighing 301 pounds or more are not subject to specific penalty based merely on the weight of the bale. However, such bales are nevertheless subject to a provision that the weight of tare shall not exceed 4.4 percent of the weight of the bale for uncompressed cotton or 4.8 percent for compressed cotton. This provision is substantially the same as that given in Southern Mill Rules.

Table 2.--Estimated ginnings of cotton and weight penalty, by specified weights of bales, Southeastern region, 1953 crop

Weight of Bale  <u>Pounds</u>	Ginnings		Weight penalty  <u>1/</u>
	Quantity	Percentage of total	
	<u>Bales</u>	<u>Percent</u>	
300 or less..	11,430	0.4	Rejection or 20 pounds per bale
301 or more..	2,900,191	99.6	None <u>2/</u>
	<u>3/</u>		
Total	2,911,621	100.0	-

1/ From trade rules of the Atlantic Cotton Association.

2/ No specific penalty based on weight of the bale but all bales subject to general provision that tare on uncompressed bales shall not exceed 4.4 percent or 4.8 percent for compressed bales.

3/ According to preliminary report of ginnings of the Bureau of the Census for the States of Alabama, Georgia, Florida, South Carolina, North Carolina, and Virginia.

The absence of a scale of weight penalties in the Southeast, unlike other regions, is probably attributable to the proximity to the mill area and to the keen competition from mill buyers who buy direct from primary sources. As a protection from claims from mills, however, cotton merchants have to exercise caution and judgment to avoid bales with excess tare even though such cases are said to be relatively infrequent.

3/ Alabama, Georgia, Florida, South Carolina, North Carolina, Virginia.



In applying penalties to bales thought to have excess tare, the buyer in the Southeast presumably estimates the amount of excess tare and deducts that amount from the weight of the bales. Or the buyer could indirectly assess the penalty by a compensatory lowering of the price. It is said that lightweight bales are less likely to have excess tare in the Southeast than in other regions, because of the prevalence of the lighter forms of reused bagging in this region. No data are available indicating the number of cases in which buyers penalize bales for excess tare.

### Tennessee, Louisiana, Mississippi

In this region about 8 percent of the 1953 crop was subject specifically and contingently to weight penalties (table 3). Specific penalties applied only to those bales weighing less than 350 pounds, a mere 0.7 percent of the 1953 crop. The penalty for these bales was either rejection or \$3 per bale. Bales in the weight group 350 to 399 and 400 to 434 pounds were subject to \$2 and \$1 penalties respectively, but those penalties did not apply when lots of 20 or more bales averaged 495 pounds or more. There were no penalties in this region for overweight bales.

Table 3. - Estimated ginnings of cotton and weight penalty, by specified weights of bales, Tennessee, Louisiana, Mississippi, 1953 crop

Weight of bale	Ginnings		Weight penalty <u>1/</u>
	Quantity	Percentage	
		of	
		total	
<u>Pounds</u>	<u>Bales</u>	<u>Percent</u>	
Less than 350.....	24,158	0.7	: Rejection or \$3 per bale
350 to 399.....	82,297	2.3	: \$2 per bale <u>2/</u>
400 to 434.....	184,946	5.1	: \$1 per bale <u>2/</u>
435 or more.....	3,288,880	91.9	: None
Total	<u>3/</u> 3,580,281	100.0	: -

1/ From trade rules of the Southern Cotton Shippers Association.

2/ Penalty not applicable if lots of 20 or more bales averaged 495 pounds or more.

3/ According to preliminary report of ginnings of the Bureau of the Census.

### Arkansas and Missouri

The penalties for bale weights in this trade region were identical with those established for Tennessee, Louisiana, and Mississippi. The proportions of the 1953 crop in Arkansas and Missouri subject to penalties for light-weight

amounted to nearly 8 percent of the crop, which was also about the same as for the Tennessee, Louisiana, and Mississippi regions (table 4).

Table 4. - Estimated ginnings of cotton and weight penalty, by specified weight of bales, Arkansas-Missouri, 1953 crop

Weight of bale	Ginnings		Weight penalty 1/
	Quantity	Percentage of total	
Pounds	Bales	Percent	
Less than 350.....	8,998	0.5	: Rejection or \$3 per bale
350 to 399.....	42,589	2.1	: \$2 per bale 2/
400 to 434.....	98,575	5.0	: \$1 per bale 2/
435 or more.....	1,829,734	92.4	: None
Total.....	3/ 1,979,896	100.0	: =

1/ From trade rules of the Arkansas-Missouri Cotton Trade Association.

2/ Penalty not applicable if lots of 20 or more bales average 495 pounds or more.

3/ According to preliminary report of ginnings of the Bureau of the Census.

#### Texas

Specific bale-weight penalties in Texas apply on a graduated basis to bales weighing less than 435 pounds and also to bales weighing 650 pounds, or more. About 6 percent of the 1953 crop in Texas was subject to penalties (table 5).

Table 5. - Estimated ginnings of cotton and weight penalty, by specified weight of bales, Texas, 1953 crop

Weight of bale	Ginnings		Weight penalty 1/
	Quantity	Percentage of total	
Pounds	Bales	Percent	
Less than 350....	20,005	0.5	: Rejection or \$7.50 per bale
350 to 399.....	44,381	1.1	: \$4 per bale
400 to 434.....	157,856	3.7	: \$1 per bale
435 to 649.....	3,977,156	94.0	: None
650 to 699.....	26,225	.6	: \$1 per bale
700 or more.....	4,203	.1	: Rejection or \$7.50 per bale
Total.....	2/ 4,229,826	100.0	: =

1/ From trade rules of the Texas Cotton Association.

2/ According to preliminary report of ginnings of the Bureau of the Census.



The potential total of assessments against Texas cotton producers for lightweight and overweight bales in the 1953 crop could have amounted to \$543,000 on the basis of the estimates given in table 5. This statement assumes that all the bales in the quantity column were penalized at the dollars and cents rates shown. In estimating the potential losses to the producers of any State or region, however, it must be remembered that cotton entering the Government loan is not subject to bale-weight penalties. However, bales weighing less than 300 pounds are not eligible for the loan.

### Oklahoma

In Oklahoma, only the weight group 476-700 pounds was free of the possibility of weight penalties. The group comprised about 74 percent of the 1953 ginnings. Hence, 26 percent of the crop was subject to weight penalties, practically all of which represented bales weighing from 300 to 475 pounds, with the penalties not applicable if lots averaged more than 475 pounds. For bales within this weight range the penalties, if applicable, represented weight deductions. The range varied from 2 pounds per bale for those weighing from 446 to 475 pounds to 9 pounds for those in the 300 to 335 weight range (table 6).

Table 6. - Estimated ginnings of cotton and weight penalty, by specified weights of bales, Oklahoma, 1953 crop

Weight of bale	Ginnings			Weight penalty <u>1/</u>
	Quantity	Percentage		
		of		
		total		
<u>Pounds</u>	<u>Bales</u>	<u>Percent</u>		
Less than 300.....	117	<u>2/</u>		Rejection or \$5 per bale
300 to 335.....	2,332	0.6		9 pounds per bale <u>3/</u>
336 to 360.....	4,198	1.0		7 pounds per bale <u>3/</u>
361 to 385.....	5,481	1.3		6 pounds per bale <u>3/</u>
386 to 405.....	9,563	2.2		5 pounds per bale <u>3/</u>
406 to 425.....	14,810	3.5		4 pounds per bale <u>3/</u>
426 to 445.....	22,274	5.2		3 pounds per bale <u>3/</u>
446 to 475.....	52,594	12.3		2 pounds per bale <u>3/</u>
476 to 700.....	315,215	73.8		None
701 or more.....	583	.1		Rejection or \$5 per bale
Total.....	<u>4/</u> 427,167	100.0		-

1/ From trade rules of Oklahoma State Cotton Exchange.

2/ Less than 0.05 percent.

3/ Penalty not applicable if bales represented by settlement invoice averaged more than 475 pounds.

4/ According to preliminary report of ginnings of the Bureau of the Census.

Western States    4/

About 5 percent of the 1953 ginnings in the States of California, Arizona, and New Mexico was subject to bale-weight penalties (table 7). In this region the penalties for light bales, 435 pounds and less, apply regardless of the average weight of the bales in the lot. The penalty for overweight bales applies when a bale weighs more than 700 pounds.

Table 7. - Estimated ginnings of cotton and weight penalty, by specified weights of bales, Western region, 1953 crop

Weight of bale	: : <u>Ginnings</u> : : Percentage : : of : : total : :	Weight penalty <u>1/</u>
<u>Pounds</u>	: <u>Bales</u> : : <u>Percent</u> : :	
Less than 350.....	6,684 0.2	: Rejection or \$3 per bale
350 to 399.....	18,715 .6	: \$2 per bale
400 to 435.....	119,776 3.9	: \$1 per bale
436 to 700.....	2,969,275 95.3	: None
More than 700.....	802 2/	: Rejection or \$3 per bale
Total.....	<u>3/</u> 3,115,252 100.0	: -

1/ From trade rules of Western Cotton Shippers Association.

2/ Less than 0.05 percent.

3/ According to preliminary report of ginnings of the Bureau of the Census for the States of Arizona, California, and New Mexico.

SUMMARY

During the 1953-54 season, the bulk of the crop, about 86 percent, was packaged in bales weighing between 451 and 650 pounds, practically all of which was free of penalty because of bale weight. About 13 percent of the bales weighed 450 pounds or less and the remaining approximately 1 percent weighed 651 pounds or more. According to trade rules in the several areas, some bales at both these extremes of the weight range were subject to a penalty in marketing.

The penalties applicable to lightweight and overweight bales vary to a considerable extent among the several regional cotton trade associations. Bales outside the range of 435 to 650 pounds - both lighter and heavier ones - are subject to penalties in one or more of the trade regions. And in one region, Oklahoma, bales up to 475 pounds may be penalized unless marketed in a lot averaging more than 475 pounds. In most regions bales weighing less than 435 pounds are subject to graduated penalties starting at \$1 per bale and increasing to \$3 per bale or more for bales weighing less than 350 pounds. In all marketing regions, bales weighing 300 pounds or less are subject to rejection as being unmerchantable or if



accepted are penalized from \$3 to \$7.50 per bale depending upon rules of the cotton trade associations. At the other extreme, penalties for overweight bales are assessed with a decided lack of uniformity.

In the three regions nearest the mill area no penalties exist for extra-heavy bales. In the Texas region, a penalty of \$1 per bale is specified for bales weighing between 650 and 699 pounds and in this region and in the Western regions bales weighing more than 700 or 701 pounds are subject to penalty. In these three regions most distant from the mill areas the stated penalties for bales exceeding 700 or 701 pounds in weight vary widely. They are \$7.50 per bale in Texas, \$5 per bale in Oklahoma and \$3 per bale in the western region.

The proportion of the 1953 crop subject to bale-weight penalties, either specific or contingent, varied greatly between regions. Oklahoma had the high of 26 percent, and the Southeastern States had the low of 0.4 percent. In both trade regions in the MidSouth the percentage was 8 and in the Texas and western regions the proportions were 6 and 5 percent, respectively. For the Cotton Belt as a whole, about 2.7 percent of the 1953 crop was subject to specific bale-weight penalties - including both lightweight and overweight penalties (table 8). An additional 3.2 percent was subject to contingent penalties depending on the average weight of the lot. The remaining 94 percent of the 1953 crop was not subject to any kind of weight penalty.

Table 8. - Estimated ginnings of cotton subject to bale-weight penalties, by cotton trade regions, United States, 1953

Item	Ginnings			
	Subject to penalty		Other	Total
	Specific	Contingent		
	Bales	Bales	Bales	Bales
Ala., Ga., Fla., S.C., N.C., & Va.	11,430	-	2,900,191	2,911,621
Tenn., La., & Miss.	24,158	267,243	3,288,880	3,580,281
Ark. & Mo.	8,998	141,164	1,829,734	1,979,896
Texas	252,670	-	3,977,156	4,229,826
Okla.	700	111,252	315,215	427,167
Calif., Ariz., & N. Mex.	145,977	-	2,969,275	3,115,252
Total	443,933	519,659	15,280,451	16,244,043
	Percent	Percent	Percent	Percent
Percentage distribution	2.7	3.2	94.1	100.0

An accurate estimate of the actual penalties assessed farmers in the marketing of their 1953 crop is not possible. For one thing, it has not been determined how closely cotton buyers adhered to the trading rules in assessing penalties for bale weights and for excessive tare. Neither is it known how many of the lightweight bales were not penalized because they went into the Government loan or were sold in multiple-bale lots possessing satisfactory average weight.

Disregarding the penalties which are or could be involved, it is highly desirable to reduce the number of lightweight and overweight bales to the greatest extent possible solely to remedy accompanying inefficiencies and difficulties in the marketing of such bales. One factor, however, prevents the entire elimination of lightweight and overweight bales. As a result of the final harvesting many growers end up with an amount of seed cotton either too small or too large to produce a standard weight bale. In such cases growers often prefer to gin and market such bales, notwithstanding potential tare or weight penalties, rather than sell the cotton in the seed as remnants. On the other hand, many penalty weight bales occur during the main period of harvesting. These bales can practically be eliminated if growers load trailers and wagons more carefully and if ginners apportion multiple bale loads of seed cotton more carefully during ginning.

There are logical reasons for at least some regional differences in bale weight penalties. However, it would seem that a more uniform approach to the matter of bale weight penalties between regions and in line with penalties that follow bales throughout marketing channels would be desirable, particularly from the standpoint of growers. This is especially true for extra-heavy bales which are penalized in only three of the six regions and also in the case of lightweight bales which are penalized individually in some regions and in others only when an entire lot of cotton averaged below specified weights per bale.

